ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

ARD-20 2000

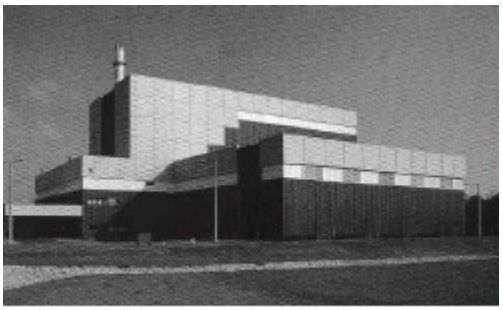
Air Emissions in New Hampshire:
Municipal Solid Waste Incinerators

Background

Until the mid 1970s, most of New Hampshire's solid waste was disposed of in landfills and town dumps. At that time, however, landfills were reaching capacity and state and federal regulations were passed prohibiting open burning at town dumps. The federal Resource Conservation and Recovery Act (RCRA) was also enacted in 1976 encouraging non-polluting methods of solid waste disposal. In response to the need for an alternative solid waste disposal method, municipal solid waste (MSW) incineration was implemented by a number of cities and towns throughout New Hampshire. Incinerators burn MSW to reduce the volume of solid waste, resulting in the production of ash which requires further disposal. Waste-to-energy incinerators recover energy from the burning of MSW in the form of steam for industrial needs, heating, or electricity generation. A key public health and environmental concern related to MSW incineration is its emissions to the air.

What is Municipal Solid Waste?

As used in this fact sheet, municipal solid waste includes primarily residential wastes with some commercial, industrial and institutional wastes, which are collected, transported, processed and disposed of by conventional means. It does not include medical and infectious wastes or by-product wastes from industrial processes (e.g., hazardous wastes).



A Waste-to-Energy Facility in New Hampshire

Municipal Solid Waste Incinerators in New Hampshire

As of September 2000, nine (9) MSW incinerators were operating in New Hampshire, two of which are waste-to-energy facilities. These facilities are listed below, along with their maximum yearly permit capacity (tons of MSW per year), maximum daily design capacity (tons of MSW per day), startup date, and number of New Hampshire municipalities served by the facility.

Facility Location	Maximum Permit Capacity (tons per year)	Maximum Design Capacity (tons per day)	Start Up Date	# of Municipalities
Concord	210,000	575	1989	28
Claremont	83,950	230	1987	15
MSW Incinerators:				
Candia	1,000	15	1977	1
Hebron/Bridgewater	1,200	14	1977	2
Litchfield	2,400	23	1983	1
Nottingham	990 (est.)	12	1973	1
Ossipee	2,200	15	1987	1
Sutton	642 (est.)	2.5	1979	1
Wilton	1,000	30	1978	1

Air Emissions from MSW Incinerators

Air emissions from municipal solid waste incinerators vary depending on the contents of the solid waste and the completeness of combustion. Pollutants from MSW combustion have potential health-related risks and adverse environmental impacts. Pollutants from MSW burning often include:

- Acid gases - sulfur dioxide and hydrogen chloride;
- Particulate Matter - non-gaseous portion (unburned MSW, unburned fuel, sulfur compounds, carbon, ash, dust);
- Carbon Monoxide - a product of incomplete combustion;
- Nitrogen oxides - contributes to smog, acid rain, particulate formation and regional haze;
- Metals - Beryllium, cadmium, manganese, mercury, nickel, vanadium; and
- Dioxins and furans - generic terms for groups of related toxic compounds.

State-of-the-art combustion facilities are equipped with pollution control equipment that greatly reduces air emissions. Pollutants present in air emissions can be controlled in several ways:

(1) **Separation Prior to Combustion** - Separation of certain materials prior to incineration is the best way individuals can reduce harmful air emissions. In particular, metals emissions are reduced if separation occurs before incineration. Suspected contributors to harmful emissions include lead soldered items, household batteries, lead acid batteries, fluorescent lights, home thermostats, and certain plastics. New Hampshire law restricting pollutant content in batteries and packaging has greatly reduced the pollutant content of the waste stream.

(2) **Combustion Control** - Proper combustion conditions are important in controlling air emissions and can limit the formation of dioxins and furans. "Good combustion practices" include continuous monitoring and control (manual and/or computerized), operator training and proper facility design, construction and maintenance. The New Hampshire Department of Environmental Services (DES)

monitors these parameters through its construction permit and permit-to-operate programs.

(3) **Removal of Pollutants from Gases by Using Post-Combustion Pollution Control Equipment** - Fabric filters (baghouses) and electrostatic precipitators (ESPs) are often used to collect and remove particulate emissions. Units to control the emissions of acid gases include scrubbers used in conjunction with fabric filters, and dry sorbent injection followed by cooling and an ESP.

State and Federal Regulations to Control Air Emissions from MSW Incinerators

In addition to many efforts to limit toxic compounds from entering the waste stream, DES regulates air emissions from MSW incinerators under the *New Hampshire Code of Administrative Rules* and the federal Clean Air Act Amendments of 1990. Regulatory applicability is dependent upon the combustion capacity of the facility, the location of the facility, the type and level of emissions, and the date the facility was constructed or modified. State rules require MSW incinerators with a design capacity greater than or equal to 1000 pounds per hour to obtain an air emissions permit. All permitted MSW incinerators are regulated for opacity (how dark or thick the smoke is), particulate matter emissions, and toxic air emissions. MSW incinerators with a throughput capacity of 4,000 pounds per hour or 48 tons per day or greater are also regulated for hydrogen chloride emissions. In addition, MSW incinerators with a throughput capacity of 100 tons per day or greater that are subject to the federal regulation for MSW are required to meet a mercury emissions standard of 0.028 milligrams per dry standard cubic meter (mg/dscm).

With the passage of the federal Clean Air Act Amendments of 1990, the U.S. Environmental Protection Agency (EPA) was charged with establishing standards for new MSW incinerators and guidelines for existing MSW incinerators. In December 1995, EPA issued standards and guidelines for MSW incinerators with a combustion capacity greater than or equal to 38.5 tons per day, which applies to four facilities in New Hampshire. Portions of these standards were vacated by the U.S. Court of Appeals, D.C. Circuit, in March 1997. Only standards applying to municipal waste combustors with capacity of 250 tons per day or greater were retained. EPA proposed to re-establish the regulations for small MSW incinerators (capacity to burn between 35 and 250 tons per day) in August 1999. Federal requirements were established for:

- Particulate matter;
- Opacity;
- Acid Gases - Sulfur dioxide (SO2) and hydrogen chloride (HCl);
- Metals - Cadmium (Cd), lead (Pb), and mercury (Hg);
- Organics - Dioxins and furans;
- Good Combustion Practices - Operator training and certification, carbon monoxide (CO) concentration measurements, flue gas temperature control, and load level control; and
- Performance Testing and Monitoring.

For More Information

For more information on municipal solid waste incinerators in New Hampshire and federal and state regulations for controlling air emissions from these facilities, please contact the:

New Hampshire Department of Environmental Services
Air Resources Division
(603) 271-1370
http://www.des.state.nh.us